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Ship to District Office AIRBORNE EXPRESS
OFFICE: Idaho Falls
ATTN: Wendy Green Lowe
FROM/DATE: Van Stille 2/3/97
JOB CHARGE: XE115

Overnight

2nd Day



TO Wendy Green Lowe
Idaho Falls

From Todd Napier
Buffalo

71919

USEPA SF



1053684

what every

Building owner should know about...



SLAG



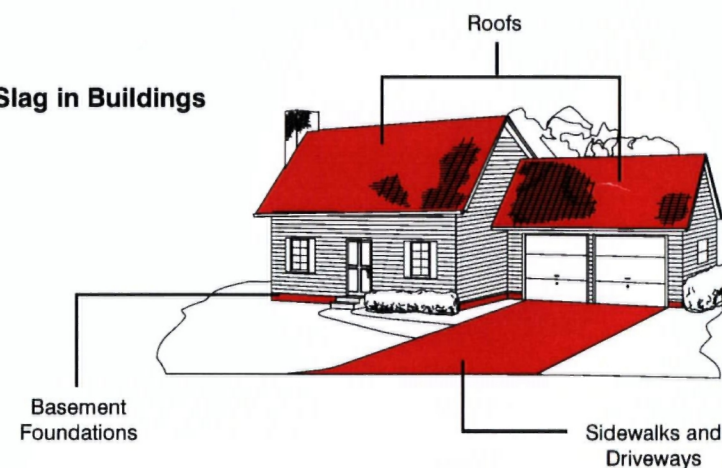
How to

Find Out if You Have a Problem with Radiation from Slag

Residents throughout Southeast Idaho are invited to participate in a voluntary program conducted jointly by the District Health Department, FMC, Monsanto, and EPA. The program helps residents find out if phosphorus slag in their homes and business properties is causing unacceptably high exposure to radiation.

The voluntary program is designed to determine if phosphorus slag has been used in your home or business property as well as measure the radiation dose of individuals living and working in buildings where phosphorus slag is found. Participation in the program is free, and it takes very little of your time.

Past Uses of Slag in Buildings



When elemental phosphorus is produced, it is removed from a mixture of phosphate ore, silica, and coke. The largest remaining by-product is a lava-like rock known as "slag." Primarily a compound of calcium and silica, slag also contains small quantities of uranium and radium. These two elements are naturally present in the phosphate ore. Their presence in the slag causes it to emit very low levels of gamma radiation - a type of radiation similar to medical x-rays.

Slag has historically been used extensively in Southeast Idaho for construction purposes as aggregate in concrete and asphalt, roadbed fill, backfill, and railroad ballast. In the 1950s, '60s, and early '70s, it was also used in the concrete poured for some basements and building foundations.



If I participate in the program, what will the results tell me?

The results will tell you whether you are being exposed to elevated radiation levels.



How much does it cost to participate in the program?

There is no cost for participating.



Where in Southeast Idaho is the program being conducted?

The focus of the study is in the communities of Pocatello and Soda Springs. Individuals in surrounding communities are welcome to participate in the program, however.

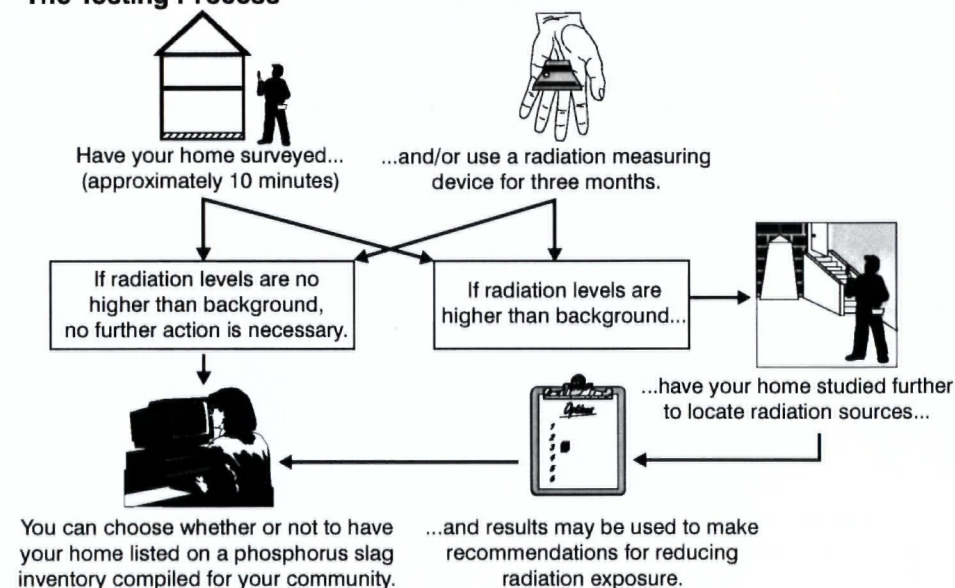
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Sign Up to Participate in the Program

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There are two ways to participate in the program. One involves a survey of your home or business property. The other involves wearing a thermoluminescent dosimeter, or TLD. People who want to know immediately if there are elevated radiation levels in their buildings may wish to participate in the building survey. Those who want to know how much radiation they are being exposed to might prefer to wear a TLD.

The Testing Process



Things to Keep in Mind:

1. Participation in the program is voluntary.
2. You may select the way you participate in the program.
3. Recommendations for reducing your radiation exposure may be based on the survey results and will be provided to you.
4. You may choose whether or not to list your building's results on the phosphorus slag inventory.



What happens if either I don't want to participate in the program or I only partially participate?

Nothing. The testing process is entirely voluntary, and an individual can decide not to participate at any time.



Can I have my business property surveyed?

Yes. Any building in Southeast Idaho can be included in the program.



How should I decide whether to have my building surveyed or to use a TLD?

That choice is entirely up to you. Some people prefer the idea of a home survey because it can be completed in a few minutes. Others prefer to know how much radiation they are being exposed to and don't mind having to wear the TLD for three months. And you don't necessarily have to choose. If you want, you can participate in the program both ways.

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SURVEYS are performed with instruments that measure radiation and identify specific locations in the buildings where radiation exceeds natural background levels. Surveys measure radiation dose rates (for example, dose per hour) and in most cases can tell you whether your building has radiation levels above background, indicating that slag may be present.

The survey team will make an appointment with you, and you must be present to have the survey conducted. Once you have given your permission to the team to enter your building, team members will check for radiation levels that are higher than would be expected for Southeast Idaho. Measurements will be taken on the main floor and in the basement. The team will spend only a few minutes in your building.

If the measurements do not show significant levels of radiation in your building, you will be given a statement of the team's findings. If elevated radiation levels are found, the team will inform you that the measurements indicate you may have slag in your building and recommend more extensive measurements.

THERMOLUMINESCENT DOSIMETERS are small devices that measure radiation dose over time. Normally, TLDs are used for a period of three months and then processed to determine the total dose accumulated during the period of exposure.

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COMPARISON OF SURVEYS AND THERMOLUMINESCENT DOSIMETERS	
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Surveys measure the rate of radiation dose in a specific location.	TLDs measure radiation dose for a specific individual or a specific location within a building over time.
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Homeowners must provide access to indoor house locations, and the method is somewhat intrusive for study participants.	While TLDs are less intrusive, individuals wearing TLDs must keep the dosimeter on or near them over the required three-month time period.



I wear a TLD at work because I am exposed to radiation as part of my job. Should I wear the TLD for the phosphorus slag program to work as well?

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Should everyone in our family get their own TLD?

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What if the building survey or TLD indicates exposure rates that are higher than expected?

If the initial building survey or TLD indicates that you may be exposed to elevated radiation levels, more extensive measurements will be recommended. These measurements will help you find out exactly where in your building you are being exposed to radiation. To participate in the more extensive dose rate measurements, you will need to make an appointment by calling the District Health Department. First, the building owner must grant permission to the team members to enter the building and perform detailed measurements. Then, they will visually inspect the building to look for physical evidence of slag. Next, they will measure the radiation dose rate in every room in the building using a meter that measures radiation levels. Finally, they will provide detailed time logs to be used in calculating each individual's radiation dose.

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The Technical Work Group is composed of two Monsanto and FMC representatives; two EPA representatives; two company-selected and two EPA-selected radiation experts; and one representative each from the City of Pocatello, the City of Soda Springs, the State of Idaho, and the Shoshone-Bannock Tribes.

Technical Work Group Members

Bill Adams
United States Environmental
Protection Agency
Seattle, Washington

Peter J. Angstadt
Mayor
Pocatello, Idaho

John Auxier
Auxier Associates
Knoxville, Tennessee

Paul Chapp
Centers for Disease Control,
Agency for Toxic Substances
and Disease Registry
Atlanta, Georgia

Farshid Farsi
Shoshone-Bannock Tribes
Fort Hall, Idaho

Thomas Gesell
Idaho State University
Pocatello, Idaho

Gary Gier
Soda Springs, Idaho

Kent Lott
Monsanto Company
Soda Springs, Idaho

Mark Masarik
United States Environmental
Protection Agency
Boise, Idaho

Pat McGavran
Idaho Department of Health
and Welfare
Boise, Idaho

Bill Moore
FMC Corporation
Pocatello, Idaho

Richard Poeton
United States Environmental
Protection Agency
Seattle, Washington

Facilitator:
Dr. Bernard Graham
Wilkes University College of
Pharmacy
Wilkes-Barre, Pennsylvania

The Phosphorus Slag Technical Work Group has developed a set of guidelines to help residents make decisions based on the results of the program. The Technical Work Group's recommendations include a range of things that can be done to reduce residents' exposure to radiation from slag. They include: attrition, or removing the slag once the structure's useful life has ended; alterations in how the occupants use the area; and building additional living space to replace areas that contribute to elevated radiation doses. After you get your results, the District Health Department will provide you with information, including the Technical Work Group's guidelines. What you do to reduce your exposure to radiation, if anything, will be entirely up to you.

The Phosphorus Slag Technical Work Group recommends the following action options for reducing individual radiation dose. The options start with the easiest and least expensive and range up to the most difficult and costly. It is the TWG's view that simpler and easier options are more appropriate for lower doses while more costly options would be more appropriate at higher doses.



No Action

Scientific opinion differs about how much low-level radiation an individual can be exposed to without harm. The possibility exists that there may be a threshold level of radiation exposure below which there are no adverse health effects. Consequently, exposure to natural background radiation levels may not pose any health risks. However, current evidence suggests that exposure to radiation at very low levels may pose some risk of cancer.



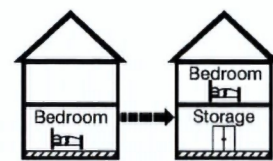
Education and Counseling

Education and counseling would include a balanced discussion of radiation risk and radiation protection measures. This would include exploring the range of possible actions that could be taken to reduce an individual's dose, such as possible changes in use patterns - like spending less time in the basement.



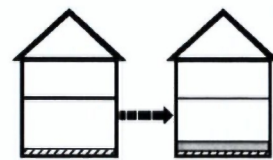
Attrition

Attrition means removing slag once a structure's useful life has ended. This would involve listing the building on the phosphorus slag inventory and subsequent removal of the slag to an appropriate disposal location when the building is demolished.



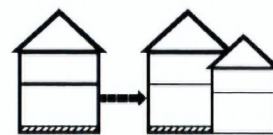
Modification of Use

Space that contributes to radiation dose would be converted to an alternative use in order to reduce the amount of time that individuals spend in a space where slag significantly contributes to individual dose.



Remodeling, Shielding, or Partial Removal

This option involves reducing exposure through physical changes to the building either through removal or shielding of the slag areas.



Additional Living Space

This option would provide additional living space to replace areas that contribute to an elevated dose. For example, a new bedroom could be built onto a home to replace a basement bedroom. The TWG anticipates that cost-effective risk reduction options will be considered on a case-by-case basis, and each homeowner will have an opportunity to discuss any specific concerns with a radiation risk professional.



How will it be determined that something must be done to reduce my exposure to gamma radiation?

If the more extensive measurements indicate that slag is present in your building, the District Health Department will present you with a copy of the Technical Work Group's recommendations for reducing your exposure to the slag. But you will make the decision about whether anything will be done, and if so, what will be done. No one will force you to do anything you don't want to do.



What if I do want to reduce my exposure according to the Technical Work Group's guidelines? Some of the options look costly. Who will pay for that?

FMC and Monsanto have agreed to pay.

Q & A

Considerations for Building Owners

No one else will be given your testing results. The results of the testing will be maintained confidentially by the testing contractor working for the District Health Department, Monsanto, and FMC. Testing results will be reported to EPA and the public in aggregate only (no names and addresses will be used). For example, we might occasionally provide statistics on how many properties have been tested and what the range of results is.

The Phosphorus Slag Inventory

The District Health Department, Monsanto, and FMC have established an "inventory" of phosphorus slag testing results for Southeast Idaho. The inventory is a listing of the most recent testing results. All residential entries in the inventory have been approved by their owners.

The inventory lists public places (including streets, sidewalks, businesses and public buildings) that have been found to contain phosphorus slag, even though such places may not contribute a significant level of exposure to radiation for most people. The primary reason for automatically listing public places in the inventory is to ensure that the slag will be adequately considered when the areas are replaced due to normal wear and tear.

What About Radon?

Residents in Southeast Idaho may experience elevated radiation doses in their homes and business properties from many sources. The primary focus of the phosphorus slag program is on gamma radiation from phosphorus slag that has been used as a building material in many area buildings. Some buildings may have elevated radon levels which increase radiation dose to the occupants. Radon is an invisible, odorless gas and a natural part of the environment. It will be important to know the level of radiation resulting from radon in addition to that resulting from phosphorus slag so that appropriate measures can be taken to protect the residents' health. Because of this, property owners participating in the program may also have their buildings surveyed for radon.



Who else will be given the results of the survey of my property?

No one. Program results will be reported in aggregate only. For example, we might provide statistics on how many properties have been evaluated and what the overall results have been.



My home was built in 1988. Should I still participate in the program?

While buildings built in the 1980s and '90s are less likely to have phosphorus slag in them than homes built in the 1950s, '60s, and '70s, we can't guarantee that they do not. If you want to know for sure whether or not your building has slag in it, you are welcome to participate in the program.



How long will the testing program be offered?

EPA, FMC, and Monsanto have agreed to conduct an initial phase of testing in 1996 and 1997. After this initial period, the testing will be available for an indefinite period of time for those individuals that would like to participate. The extended offer will be particularly useful to either new residents or individuals that would like to have a residence retested after making changes to reduce exposure.

Recommendations for

P eople Who are Buying or Selling a Building

EPA's Recommendations for People Who Are Buying a Building:

1. Contact the District Health Department to determine if the building is listed on the Southeast Idaho Phosphorus Slag Inventory.
2. If the building is not listed on the inventory, you may want to ask the building owner to have it tested. Find out the results.
3. If the test results of a building you purchase indicate the potential for elevated radiation exposure due to the presence of phosphorus slag, take action to reduce that exposure. Consult the Technical Work Group's recommendations and have the building retested.

EPA's Recommendations for People Who Are Selling a Building:

1. If you haven't already done so, sign up to participate in the program. Find out if phosphorus slag in your building is causing elevated radiation levels.
2. If testing results indicate the potential for exposure to elevated radiation levels as a result of phosphorus slag, take action to reduce that exposure according to the Technical Work Group's recommendations.
3. After taking action to reduce radiation exposure, have the building retested to find out if the action was effective. Have the District Health Department update the information in the Southeast Idaho Phosphorus Slag Inventory.



Will this program
affect my property
values?

If you have your property tested and (1) no elevated radiation levels are found or (2) elevated radiation levels are reduced by implementing one of the Technical Work Group's recommended action options, then prospective buyers can be reassured. Such reassurance should enhance your property's value as compared to other properties that have not been tested.

Q & A

Questions and Answers

What is Radiation?

Some atoms, known as "radionuclides", are unstable—or radioactive. Radionuclides undergo a spontaneous decay process and emit one or more types of radiation until they reach a stable form. There are three main types of radiation: alpha radiation; beta radiation; and gamma radiation, which is very similar to x-rays. This program is limited to gamma radiation that is emitted by phosphorus slag. Gamma radiation consists of electromagnetic waves, which can penetrate skin and travel through the human body.

Naturally occurring radioactive materials in the earth—primarily uranium, thorium, radium, radon, and potassium—and cosmic rays from outer space immerse us in fluctuating amounts of radiation at all times. Background radiation varies by location and results from a combination of cosmic radiation and naturally occurring radiation in the earth. The phosphorus slag program looks for buildings where radiation levels exceed the expected background level.

In addition to naturally occurring sources of radiation, people are exposed to manufactured sources of radiation as well, including medical applications, consumer goods, and the operation of the nuclear power industry. Medical doctors use man-made radiation for diagnosis and treatment of cancer and other diseases.

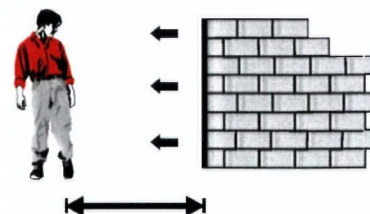
Of the total amount of radiation that the average person in the United States is exposed to every year, 82% comes from natural sources and 18% from non-natural sources. Medical diagnosis and therapy account for more than 90% of the dose from non-natural sources. Despite the benefits of radiation in our modern world, increases in exposure to radiation have been linked to increases in cancer rates. For that reason, the phosphorus slag program seeks to reduce exposure to radiation for residents of Southeast Idaho.

FACTORS THAT AFFECT YOUR RADIATION EXPOSURE

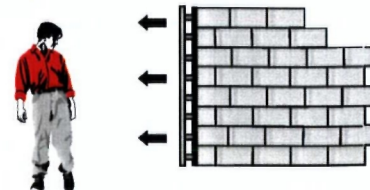
- How long and how often you are exposed



- How far away you are from the source



- How much shielding or absorbing material is present



How does Radiation Affect Human Health?

High doses of radiation can be harmful or even fatal. The damage caused by exposure to radiation is determined by the type of radiation, the duration of exposure, and the part of the body that is exposed. The effects of a radiation dose are either prompt or delayed. Prompt effects occur within the first several months after exposure. Delayed effects occur over many years. The delayed effects can include cancer or other diseases in exposed persons and harmful effects on unborn children.

It is important to note that an average of one in four people develops some form of cancer. Excess lifetime cancer risks resulting from exposure to radiation are calculated in addition to this number. Risk estimates assume that even small amounts of radiation pose some risk.

The total number of observed cancers in Southeast Idaho is low by national standards. Healthy lifestyles, rural living, and a low incidence of smoking and drinking likely contribute to the lower overall incidence of cancer in this area. Despite low cancer rates in the region, however, EPA remains concerned about possible increases in cancer risk that may be associated with slag. For that reason, EPA, Monsanto, and FMC are hopeful that area residents will participate in the phosphorus slag program.



What level of radiation is safe?

No one knows for sure. This question is of on going interest to scientists and researchers.



How is radiation dose measured?

Radiation dose is the amount of radiation that is absorbed by the body. The human body's absorption of ionizing radiation is measured in units called "rems". Low levels of radiation are measured in thousandths of a rem, or "millirems".

For more

Information



I still have lots of questions. Where can I get more information?

By calling one of the following phone numbers:

The United States Environmental Protection Agency (800) 424-4EPA

The Southeast Idaho District Health Department, in Pocatello at (208) 233-9080 and in Soda Springs at (208) 547-4375

The Health Education Office on Fort Hall Indian Reservation at (208) 238-3953

FMC (Jim Rice) at (208) 236-8685

Monsanto (Trent Clark) at (208) 547-4300 extension 348

Or by visiting one of the following libraries and District Health Department offices:

PUBLIC LIBRARIES

The following libraries have materials related to the phosphorus slag program:

Pocatello Public Library
113 South Garfield
Pocatello, ID 83204
(208) 232-1263

Soda Springs Public Library
149 South Main
Soda Springs, ID 83276
(208) 547-2606

Idaho State University Library
Government Documents Department
9th and Terry
Pocatello, ID 83209
(208) 236-2940

Shoshone-Bannock Library
Pima and Bannock
Fort Hall, ID 83203
(208) 238-3700, extension 3882

Portneuf District Library
5210 Stuart Street
Chubbuck, ID 83202
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Or by borrowing the video entitled, "Do You Have Slag in Your Home?" from one of the libraries or offices listed above.



what every

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SLAG



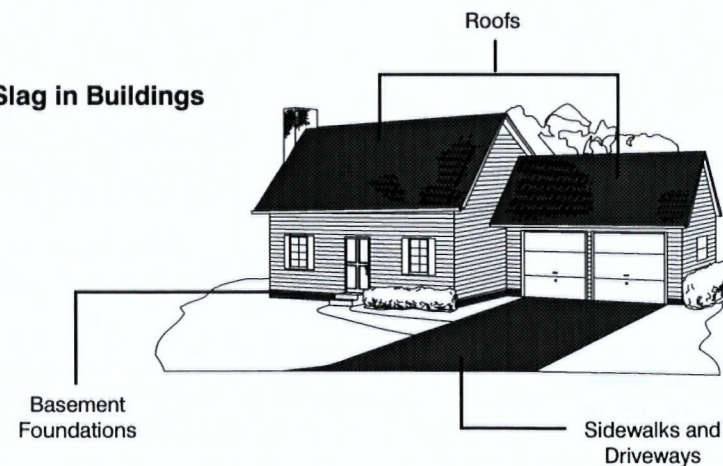
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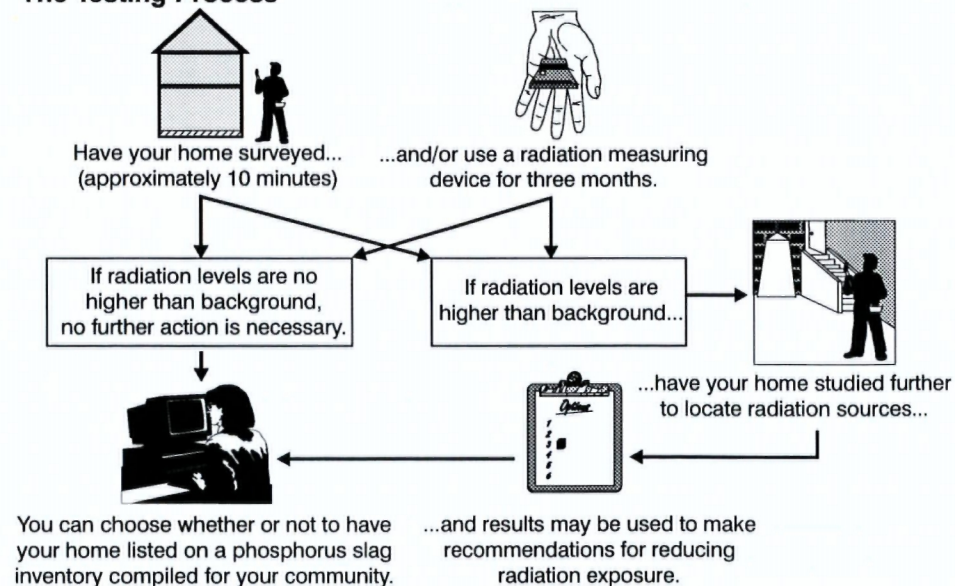
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Peter J. Angstadt
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John Auxler
Auxler Associates
Knoxville, Tennessee

Paul Charp
Centers for Disease Control,
Agency for Toxic Substances
and Disease Registry
Atlanta, Georgia

Farshid Farsi
Shoshone-Bannock Tribes
Fort Hall, Idaho

Thomas Gesell
Idaho State University
Pocatello, Idaho

Gary Gier
Soda Springs, Idaho

Kent Lott
Monsanto Company
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Mark Masarik
United States Environmental
Protection Agency
Boise, Idaho

Pat McGavran
Idaho Department of Health
and Welfare
Boise, Idaho

Bill Moore
FMC Corporation
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United States Environmental
Protection Agency
Seattle, Washington

Facilitator:
Dr. Bernard Graham
Wilkes University College of
Pharmacy
Wilkes-Barre, Pennsylvania

The Phosphorus Slag Technical Work Group has developed a set of guidelines to help residents make decisions based on the results of the program. The Technical Work Group's recommendations include a range of things that can be done to reduce residents' exposure to radiation from slag. They include: attrition, or removing the slag once the structure's useful life has ended; alterations in how the occupants use the area; and building additional living space to replace areas that contribute to elevated radiation doses. After you get your results, the District Health Department will provide you with information, including the Technical Work Group's guidelines. What you do to reduce your exposure to radiation, if anything, will be entirely up to you.

The Phosphorus Slag Technical Work Group recommends the following action options for reducing individual radiation dose. The options start with the easiest and least expensive and range up to the most difficult and costly. It is the TWG's view that simpler and easier options are more appropriate for lower doses while more costly options would be more appropriate at higher doses.



No Action

Scientific opinion differs about how much low-level radiation an individual can be exposed to without harm. The possibility exists that there may be a threshold level of radiation exposure below which there are no adverse health effects. Consequently, exposure to natural background radiation levels may not pose any health risks. However, current evidence suggests that exposure to radiation at very low levels may pose some risk of cancer.



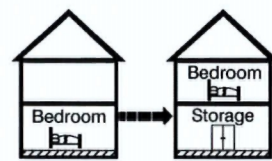
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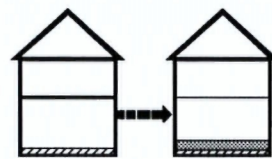
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Attrition means removing slag once a structure's useful life has ended. This would involve listing the building on the phosphorus slag inventory and subsequent removal of the slag to an appropriate disposal location when the building is demolished.



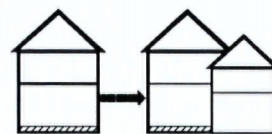
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Space that contributes to radiation dose would be converted to an alternative use in order to reduce the amount of time that individuals spend in a space where slag significantly contributes to individual dose.



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This option involves reducing exposure through physical changes to the building either through removal or shielding of the slag areas.



Additional Living Space

This option would provide additional living space to replace areas that contribute to an elevated dose. For example, a new bedroom could be built onto a home to replace a basement bedroom. The TWG anticipates that cost-effective risk reduction options will be considered on a case-by-case basis, and each homeowner will have an opportunity to discuss any specific concerns with a radiation risk professional.



How will it be determined that something must be done to reduce my exposure to gamma radiation?

If the more extensive measurements indicate that slag is present in your building, the District Health Department will present you with a copy of the Technical Work Group's recommendations for reducing your exposure to the slag. But you will make the decision about whether anything will be done, and if so, what will be done. No one will force you to do anything you don't want to do.



What if I do want to reduce my exposure according to the Technical Work Group's guidelines? Some of the options look costly. Who will pay for that?

FMC and Monsanto have agreed to pay.

Q & A

Considerations for Building Owners

No one else will be given your testing results. The results of the testing will be maintained confidentially by the testing contractor working for the District Health Department, Monsanto, and FMC. Testing results will be reported to EPA and the public in aggregate only (no names and addresses will be used). For example, we might occasionally provide statistics on how many properties have been tested and what the range of results is.

The Phosphorus Slag Inventory

The District Health Department, Monsanto, and FMC have established an "inventory" of phosphorus slag testing results for Southeast Idaho. The inventory is a listing of the most recent testing results. All residential entries in the inventory have been approved by their owners.

The inventory lists public places (including streets, sidewalks, businesses and public buildings) that have been found to contain phosphorus slag, even though such places may not contribute a significant level of exposure to radiation for most people. The primary reason for automatically listing public places in the inventory is to ensure that the slag will be adequately considered when the areas are replaced due to normal wear and tear.

What About Radon?

Residents in Southeast Idaho may experience elevated radiation doses in their homes and business properties from many sources. The primary focus of the phosphorus slag program is on gamma radiation from phosphorus slag that has been used as a building material in many area buildings. Some buildings may have elevated radon levels which increase radiation dose to the occupants. Radon is an invisible, odorless gas and a natural part of the environment. It will be important to know the level of radiation resulting from radon in addition to that resulting from phosphorus slag so that appropriate measures can be taken to protect the residents' health. Because of this, property owners participating in the program may also have their buildings surveyed for radon.



Who else will be given the results of the survey of my property?

No one. Program results will be reported in aggregate only. For example, we might provide statistics on how many properties have been evaluated and what the overall results have been.



My home was built in 1988. Should I still participate in the program?

While buildings built in the 1980s and '90s are less likely to have phosphorus slag in them than homes built in the 1950s, '60s, and '70s, we can't guarantee that they do not. If you want to know for sure whether or not your building has slag in it, you are welcome to participate in the program.



How long will the testing program be offered?

EPA, FMC, and Monsanto have agreed to conduct an initial phase of testing in 1996 and 1997. After this initial period, the testing will be available for an indefinite period of time for those individuals that would like to participate. The extended offer will be particularly useful to either new residents or individuals that would like to have a residence retested after making changes to reduce exposure.

Recommendations for

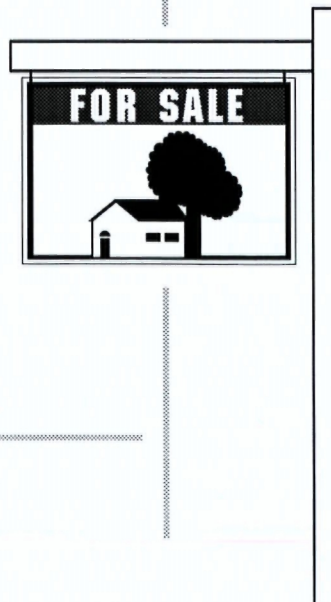
P eople Who are Buying or Selling a Building

EPA's Recommendations for People Who Are Buying a Building:

1. Contact the District Health Department to determine if the building is listed on the Southeast Idaho Phosphorus Slag Inventory.
2. If the building is not listed on the inventory, you may want to ask the building owner to have it tested. Find out the results.
3. If the test results of a building you purchase indicate the potential for elevated radiation exposure due to the presence of phosphorus slag, take action to reduce that exposure. Consult the Technical Work Group's recommendations and have the building retested.

EPA's Recommendations for People Who Are Selling a Building:

1. If you haven't already done so, sign up to participate in the program. Find out if phosphorus slag in your building is causing elevated radiation levels.
2. If testing results indicate the potential for exposure to elevated radiation levels as a result of phosphorus slag, take action to reduce that exposure according to the Technical Work Group's recommendations.
3. After taking action to reduce radiation exposure, have the building retested to find out if the action was effective. Have the District Health Department update the information in the Southeast Idaho Phosphorus Slag Inventory.



Will this program
affect my property
values?

If you have your property tested and (1) no elevated radiation levels are found or (2) elevated radiation levels are reduced by implementing one of the Technical Work Group's recommended action options, then prospective buyers can be reassured. Such reassurance should enhance your property's value as compared to other properties that have not been tested.

Q & A

More

Questions and Answers

What is Radiation?

Some atoms, known as "radionuclides", are unstable—or radioactive. Radionuclides undergo a spontaneous decay process and emit one or more types of radiation until they reach a stable form. There are three main types of radiation: alpha radiation; beta radiation; and gamma radiation, which is very similar to x-rays. This program is limited to gamma radiation that is emitted by phosphorus slag. Gamma radiation consists of electromagnetic waves, which can penetrate skin and travel through the human body.

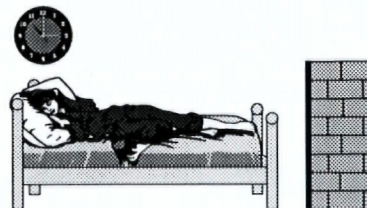
Naturally occurring radioactive materials in the earth—primarily uranium, thorium, radium, radon, and potassium—and cosmic rays from outer space immerse us in fluctuating amounts of radiation at all times. Background radiation varies by location and results from a combination of cosmic radiation and naturally occurring radiation in the earth. The phosphorus slag program looks for buildings where radiation levels exceed the expected background level.

In addition to naturally occurring sources of radiation, people are exposed to manufactured sources of radiation as well, including medical applications, consumer goods, and the operation of the nuclear power industry. Medical doctors use man-made radiation for diagnosis and treatment of cancer and other diseases.

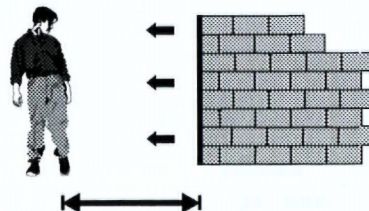
Of the total amount of radiation that the average person in the United States is exposed to every year, 82% comes from natural sources and 18% from non-natural sources. Medical diagnosis and therapy account for more than 90% of the dose from non-natural sources. Despite the benefits of radiation in our modern world, increases in exposure to radiation have been linked to increases in cancer rates. For that reason, the phosphorus slag program seeks to reduce exposure to radiation for residents of Southeast Idaho.

FACTORS THAT AFFECT YOUR RADIATION EXPOSURE

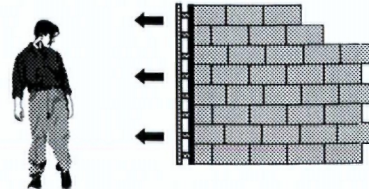
- How long and how often you are exposed



- How far away you are from the source



- How much shielding or absorbing material is present



How does Radiation Affect Human Health?

High doses of radiation can be harmful or even fatal. The damage caused by exposure to radiation is determined by the type of radiation, the duration of exposure, and the part of the body that is exposed. The effects of a radiation dose are either prompt or delayed. Prompt effects occur within the first several months after exposure. Delayed effects occur over many years. The delayed effects can include cancer or other diseases in exposed persons and harmful effects on unborn children.

It is important to note that an average of one in four people develops some form of cancer. Excess lifetime cancer risks resulting from exposure to radiation are calculated in addition to this number. Risk estimates assume that even small amounts of radiation pose some risk.

The total number of observed cancers in Southeast Idaho is low by national standards. Healthy lifestyles, rural living, and a low incidence of smoking and drinking likely contribute to the lower overall incidence of cancer in this area. Despite low cancer rates in the region, however, EPA remains concerned about possible increases in cancer risk that may be associated with slag. For that reason, EPA, Monsanto, and FMC are hopeful that area residents will participate in the phosphorus slag program.



What level of radiation is safe?

No one knows for sure. This question is of on going interest to scientists and researchers.



How is radiation dose measured?

Radiation dose is the amount of radiation that is absorbed by the body. The human body's absorption of ionizing radiation is measured in units called "rems". Low levels of radiation are measured in thousandths of a rem, or "millirems".

For more

nformation



I still have lots of questions. Where can I get more information?

By calling one of the following phone numbers:

The United States Environmental Protection Agency (800) 424-EPA

The Southeast Idaho District Health Department, in Pocatello at (208) 233-9080 and in Soda Springs at (208) 547-4375

The Health Education Office on Fort Hall Indian Reservation at (208) 238-3953

FMC (Jim Rice) at (208) 236-8685

Monsanto (Trent Clark) at (208) 547-4300 extension 348

Or by visiting one of the following libraries and District Health Department offices:

PUBLIC LIBRARIES

The following libraries have materials related to the phosphorus slag program:

Pocatello Public Library
113 South Garfield
Pocatello, ID 83204
(208) 232-1263

Soda Springs Public Library
149 South Main
Soda Springs, ID 83276
(208) 547-2606

Idaho State University Library
Government Documents Department
9th and Terry
Pocatello, ID 83209
(208) 236-2940

Shoshone-Bannock Library
Pima and Bannock
Fort Hall, ID 83203
(208) 238-3700, extension 3882

Portneuf District Library
5210 Stuart Street
Chubbuck, ID 83202
(208) 237-2192

Or by borrowing the video entitled, "Do You Have Slag in Your Home?" from one of the libraries or offices listed above.



Monsanto



what every

B

uilding owner should know about...



SLAG

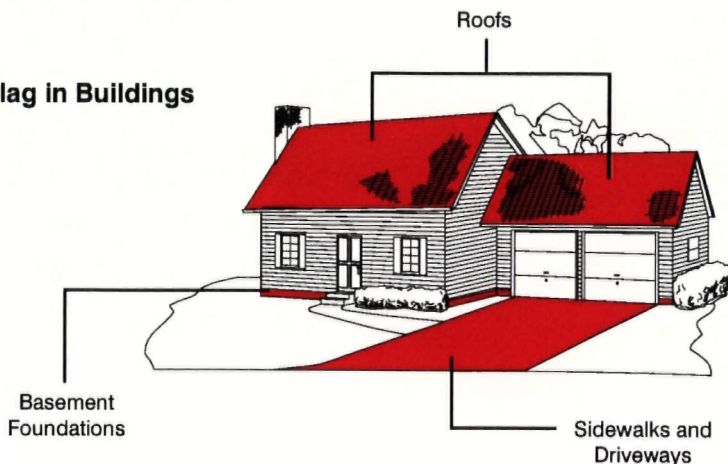


Find Out if You Have from Slag

Residents throughout Southeast Idaho are invited to participate in a voluntary program conducted jointly by the District Health Department, FMC, Monsanto, and EPA. The program helps residents find out if phosphorus slag in their homes and business properties is causing unacceptably high exposure to radiation.

The voluntary program is designed to determine if phosphorus slag has been used in your home or business property as well as measure the radiation dose of individuals living and working in buildings where phosphorus slag is found. Participation in the program is free, and it takes very little of your time.

Past Uses of Slag in Buildings



When elemental phosphorus is produced, it is removed from a mixture of phosphate ore, silica, and coke. The largest remaining by-product is a lava-like rock known as "slag." Primarily a compound of calcium and silica, slag also contains small quantities of uranium and radium. These two elements are naturally present in the phosphate ore. Their presence in the slag causes it to emit very low levels of gamma radiation - a type of radiation similar to medical x-rays.

Slag has historically been used extensively in Southeast Idaho for construction purposes as aggregate in concrete and asphalt, roadbed fill, backfill, and railroad ballast. In the 1950s, '60s, and early '70s, it was also used in the concrete poured for some basements and building foundations.

a Problem with Radiation



If I participate in the program, what will the results tell me?

The results will tell you whether you are being exposed to elevated radiation levels.



How much does it cost to participate in the program?

There is no cost for participating.



Where in Southeast Idaho is the program being conducted?

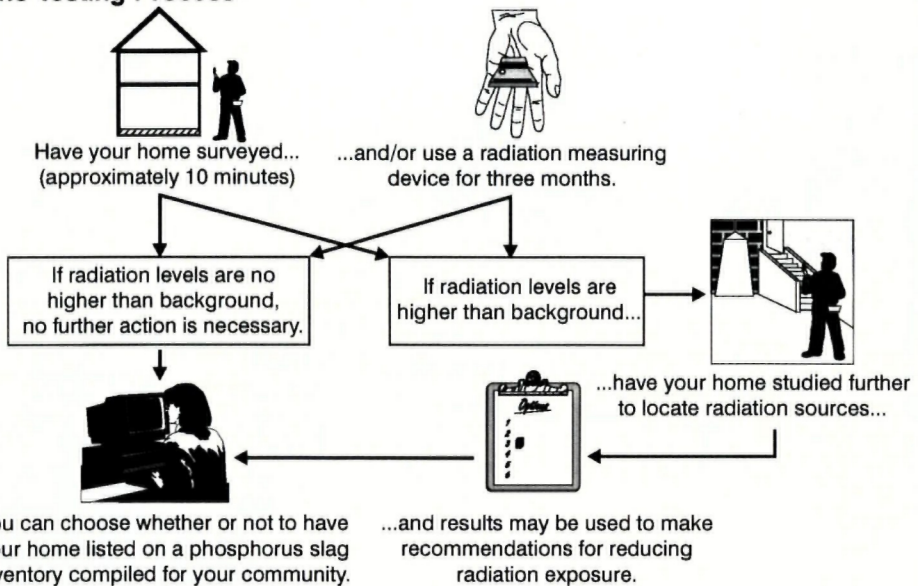
The focus of the study is in the communities of Pocatello and Soda Springs. Individuals in surrounding communities are welcome to participate in the program, however.

Sign Up to Participate

Homeowners and other building owners who wish to participate in the voluntary exposure study can call the Southeast Idaho District Health Department either at 233-9080 in Pocatello or 547-4375 in Soda Springs.

There are two ways to participate in the program. One involves a survey of your home or business property. The other involves wearing a thermoluminescent dosimeter, or TLD. People who want to know immediately if there are elevated radiation levels in their buildings may wish to participate in the building survey. Those who want to know how much radiation they are being exposed to might prefer to wear a TLD.

The Testing Process



Things to Keep in Mind:

1. Participation in the program is voluntary.
2. You may select the way you participate in the program.
3. Recommendations for reducing your radiation exposure may be based on the survey results and will be provided to you.
4. You may choose whether or not to list your building's results on the phosphorus slag inventory.

te in the Program



What happens if either I don't want to participate in the program or I only partially participate?

Nothing. The testing process is entirely voluntary, and an individual can decide not to participate at any time.



Can I have my business property surveyed?

Yes. Any building in Southeast Idaho can be included in the program. If elevated radiation levels resulting from slag are found in your building, federal and state laws may require that you report the levels to all building occupants.



How should I decide whether to have my building surveyed or to use a TLD?

That choice is entirely up to you. Some people prefer the idea of a home survey because it can be completed in a few minutes. Others prefer to know how much radiation they are being exposed to and don't mind having to wear the TLD for three months. And you don't necessarily have to choose. If you want, you can participate in the program both ways.

Surveys and the The

SURVEYS are performed with instruments that measure radiation and identify specific locations in the buildings where radiation exceeds natural background levels. Surveys measure radiation dose rates (for example, dose per hour) and in most cases can tell you whether your building has radiation levels above background, indicating that slag may be present.

The survey team will make an appointment with you, and you must be present to have the survey conducted. Once you have given your permission to the team to enter your building, team members will check for radiation levels that are higher than would be expected for Southeast Idaho. Measurements will be taken on the main floor and in the basement. The team will spend only a few minutes in your building.

If the measurements do not show significant levels of radiation in your building, you will be given a statement of the team's findings. If elevated radiation levels are found, the team will inform you that the measurements indicate you may have slag in your building and recommend more extensive measurements.

THERMOLUMINESCENT DOSIMETERS are small devices that measure radiation dose over time. Normally, TLDs are used for a period of three months and then processed to determine the total dose accumulated during the period of exposure.

To find out how much radiation you are being exposed to, you can sign up to use a thermoluminescent dosimeter, or TLD. A TLD is an instrument that measures how much radiation a person is being exposed to. You can make an appointment to pick up a TLD by calling the District Health Department in Pocatello or Soda Springs. During your appointment, you will be given a demonstration for proper use of the TLD. TLDs are small enough to be used on a key ring, which is how it is recommended you use it.

In order to obtain a measurement that reflects your living habits, a TLD should be used for a period of three months. That means that you need to carry it with you, or have it near you, at all times. For example, you could place it on a bedside table at night while you sleep. After three months, you should bring the TLD back to the District Health Department, which will have it processed and provide you with your results within three weeks.

COMPARISON OF SURVEYS AND THERMOLUMINESCENT DOSIMETERS

SURVEYS	TLDs
Surveys measure the rate of radiation dose in a specific location.	TLDs measure radiation dose for a specific individual or a specific location within a building over time.
Surveys provide immediate results.	TLDs must be used over a period of three months.
Homeowners must provide access to indoor house locations, and the method is somewhat intrusive for study participants.	While TLDs are less intrusive, individuals wearing TLDs must keep the dosimeter on or near them over the required three-month time period.

Thermoluminescent Dosimeters



I wear a TLD at work because I am exposed to radiation as part of my job. Should I wear the TLD for the phosphorus slag program to work as well?

Yes. This program is designed to assess total exposure to radiation, including radiation doses received at work and doses received at home. Subtracting the radiation dose you receive at work from the total dose measured by the TLD will help determine how much radiation you are being exposed to at home. If you were to leave the TLD at home, it would tell you only what radiation dose you would receive if you stayed at home all the time.



Should everyone in our family get their own TLD?

That's really up to you. It does require some effort to keep track of the TLD for three months. What you might consider is having the person who spends the most time at home wear the TLD. If the results indicate elevated radiation exposures, other family members can always decide to wear a TLD later.



What if the building survey or TLD indicates exposure rates that are higher than expected?

If the initial building survey or TLD indicates that you may be exposed to elevated radiation levels, more extensive measurements will be recommended. These measurements will help you find out exactly where in your building you are being exposed to radiation. To participate in the more extensive dose rate measurements, you will need to make an appointment by calling the District Health Department. First, the building owner must grant permission to the team members to enter the building and perform detailed measurements. Then, they will visually inspect the building to look for physical evidence of slag. Next, they will measure the radiation dose rate in every room in the building using a meter that measures radiation levels. Finally, they will provide detailed time logs to be used in calculating each individual's radiation dose.

Building Has Slag i

In 1992, FMC, Monsanto, and the U.S. EPA joined together to form the Phosphorus Slag Technical Work Group. The Technical Work Group was convened to develop guidelines to help individuals interpret radiation exposure results from the phosphorus slag program and determine what, if any, action should be taken to reduce their exposure.

The Technical Work Group is composed of two Monsanto and FMC representatives; two EPA representatives; two company-selected and two EPA-selected radiation experts; and one representative each from the City of Pocatello, the City of Soda Springs, the State of Idaho, and the Shoshone-Bannock Tribes.

Technical Work Group Members

Bill Adams

United States Environmental
Protection Agency
Seattle, Washington

Peter J. Angstadt

Mayor
Pocatello, Idaho

John Auxier

Auxier Associates
Knoxville, Tennessee

Paul Charp

Centers for Disease Control,
Agency for Toxic Substances
and Disease Registry
Atlanta, Georgia

Farshid Farsi

Shoshone-Bannock Tribes
Fort Hall, Idaho

Thomas Gesell

Idaho State University
Pocatello, Idaho

Gary Gier

Soda Springs, Idaho

Kent Lott

Monsanto Company
Soda Springs, Idaho

Mark Masarik

United States Environmental
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Wilkes University College of
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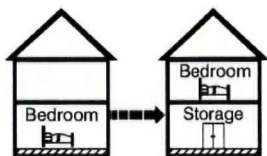
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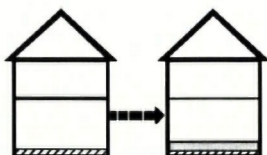
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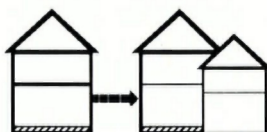
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The inventory also lists public places (including streets, sidewalks, and public buildings) that have been found to contain phosphorus slag, even though such places may not contribute a significant level of exposure to radiation for most people. The primary reason for automatically listing public places in the inventory is to ensure that the slag will be adequately considered when the areas are replaced due to normal wear and tear.

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Building Owners



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While buildings built in the 1980s and '90s are less likely to have phosphorus slag in them than homes built in the 1950s, '60s, and '70s, we can't guarantee that they do not. If you want to know for sure whether or not your building has slag in it, you are welcome to participate in the program.



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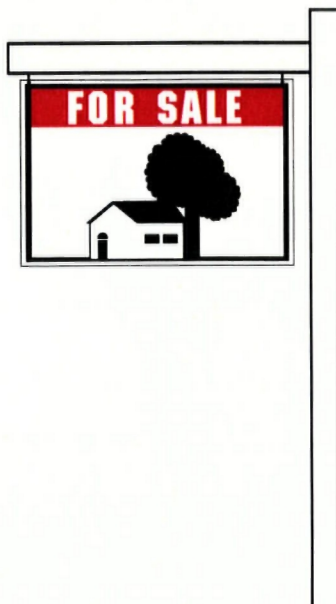
P eople Who are B

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EPA's Recommendations for People Who Are Selling a Building:

1. If you haven't already done so, sign up to participate in the program. Find out if phosphorus slag in your building is causing elevated radiation levels.
2. If testing results indicate the potential for exposure to elevated radiation levels as a result of phosphorus slag, take action to reduce that exposure according to the Technical Work Group's recommendations.
3. After taking action to reduce radiation exposure, have the building retested to find out if the action was effective. Have the District Health Department update the information in the Southeast Idaho Phosphorus Slag Inventory.



Buying or Selling a Building



Will this program
affect my property
values?

It shouldn't, given the confidential nature of the program. Others will not know your results unless you choose to disclose them. Whether you suspect that slag is in your building or not, your test results may be useful information to provide to prospective buyers. If your building is found to be free of slag, you may want to share that information. Alternatively, if slag is found in your building and test results indicate that actions should be considered to reduce your exposure to radiation, then you will have an opportunity to reduce your exposure based on the Technical Work Group's recommended actions. Any actions taken to reduce exposure could be useful information to prospective buyers. In some situations, such actions may enhance the value of your property as compared to other buildings where action to reduce exposure was warranted but not taken.

Questions and Answers

What is Radiation?

Some atoms, known as "radionuclides", are unstable—or radioactive. Radionuclides undergo a spontaneous decay process and emit one or more types of radiation until they reach a stable form. There are three main types of radiation: alpha radiation; beta radiation; and gamma radiation, which is very similar to x-rays. This program is limited to gamma radiation that is emitted by phosphorus slag. Gamma radiation consists of electromagnetic waves, which can penetrate skin and travel through the human body.

Naturally occurring radioactive materials in the earth—primarily uranium, thorium, radium, radon, and potassium—and cosmic rays from outer space immerse us in fluctuating amounts of radiation at all times. Background radiation varies by location and results from a combination of cosmic radiation and naturally occurring radiation in the earth. The phosphorus slag program looks for buildings where radiation levels exceed the expected background level.

In addition to naturally occurring sources of radiation, people are exposed to manufactured sources of radiation as well, including medical applications, consumer goods, and the operation of the nuclear power industry. Medical doctors use man-made radiation for diagnosis and treatment of cancer and other diseases.

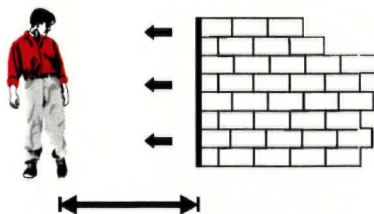
Of the total amount of radiation that the average person in the United States is exposed to every year, 82% comes from natural sources and 18% from non-natural sources. Medical diagnosis and therapy account for more than 90% of the dose from non-natural sources. Despite the benefits of radiation in our modern world, increases in exposure to radiation have been linked to increases in cancer rates. For that reason, the phosphorus slag program seeks to reduce exposure to radiation for residents of Southeast Idaho.

FACTORS THAT AFFECT YOUR RADIATION EXPOSURE

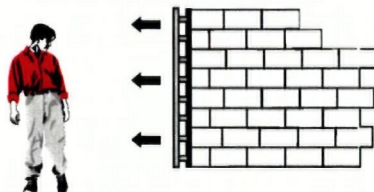
- How long and how often you are exposed



- How far away you are from the source



- How much shielding or absorbing material is present



Answers

How does Radiation Affect Human Health?

High doses of radiation can be harmful or even fatal. The damage caused by exposure to radiation is determined by the type of radiation, the duration of exposure, and the part of the body that is exposed. The effects of a radiation dose are either prompt or delayed. Prompt effects occur within the first several months after exposure. Delayed effects occur over many years. The delayed effects can include cancer or other diseases in exposed persons and harmful effects on unborn children.

It is important to note that an average of one in four people develops some form of cancer. Excess lifetime cancer risks resulting from exposure to radiation are calculated in addition to this number. Risk estimates assume that even small amounts of radiation pose some risk.

The total number of observed cancers in Southeast Idaho is low by national standards. Healthy lifestyles, rural living, and a low incidence of smoking and drinking likely contribute to the lower overall incidence of cancer in this area. Despite low cancer rates in the region, however, EPA remains concerned about possible increases in cancer risk that may be associated with slag. For that reason, EPA, Monsanto, and FMC are hopeful that area residents will participate in the phosphorus slag program.



What level of radiation is safe?

No one knows for sure. This question is of ongoing interest to scientists and researchers.



How is radiation dose measured?

Radiation dose is the amount of radiation that is absorbed by the body. The human body's absorption of ionizing radiation is measured in units called "rems". Low levels of radiation are measured in thousandths of a rem, or "millirems".

For more

Information



I still have lots of questions. Where can I get more information?

The United States Environmental Protection Agency (800) 424-4EPA

The Southeast Idaho District Health Department, in Pocatello at (208) 233-9080 and in Soda Springs at (208) 547-4375

The Health Education Office on Fort Hall Indian Reservation at (208) 238-3953

FMC (Jim Rice) at (208) 236-8685

Monsanto (Trent Clark) at (208) 547-4300 extension 348

Or by visiting one of the following libraries and District Health Department offices:

PUBLIC LIBRARIES

The following libraries have materials related to the phosphorus slag program:

Pocatello Public Library
113 South Garfield
Pocatello, ID 83204
(208) 232-1263

Soda Springs Public Library
149 South Main
Soda Springs, ID 83276
(208) 547-2606

Idaho State University Library
Government Documents Department
9th and Terry
Pocatello, ID 83209
(208) 236-2940

Shoshone-Bannock Library
Pima and Bannock
Fort Hall, ID 83203
(208) 238-3700, extension 3882

Portneuf District Library
5210 Stuart Street
Chubbuck, ID 83202
(208) 237-2192



Monsanto



Or by borrowing the video entitled, "Do You Have Slag in Your Home?" from one of the libraries or offices listed above.